How to configure services in the EPOS Data Portal

In the previous module the focus was on how to find services through different types of filters. This tutorial will demonstrate in more detail how to customize data retrieval from one or multiple services to better represent the search area of interest.

Where does the configuration takes place?

As demonstrated in the previous module, data could be constrained by coordinates and time in the main toolbar just below the banner. However, most services provide additional configure options to better constrain data retrieval. These options are commonly referred to as parameters. Information about available parameters and their limitations, as well as the actual editing of parameters takes place within the configuration tab right next to the details tab (fig. 1). If the information within the configuration tab is blank, it means that a service has not been selected. However, if this tab is filled without a service being selected, that means that the service used in the last web session is still activated through the browser cache.
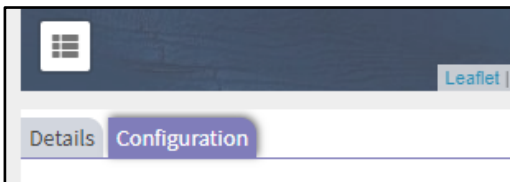

Figure 1: Configuration tab, located just below the map, for displaying all configuration information and options.

Which options are available for configuration?

The options available for configurations are defined by the community standard formats used in the services. Data can be accessible through multiple service types to give the user a variety of configurable options. A good example of such a diversity, are the services that expose historical earthquake data. To find these services, search for the keyword, "earthquake", within the advanced search area (fig. 2).
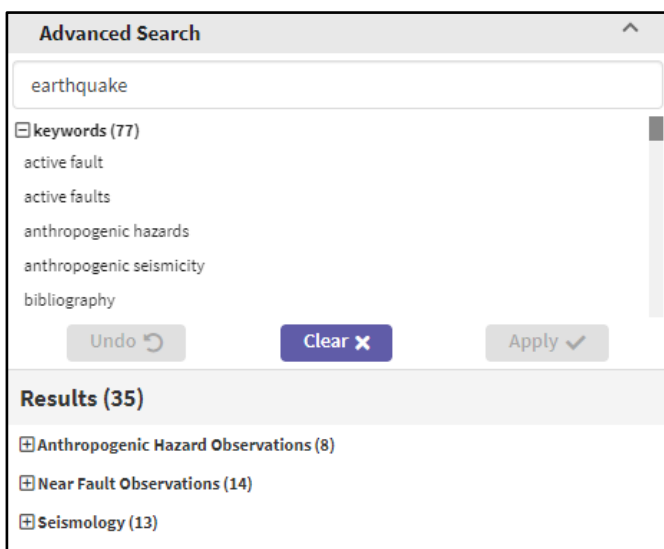

Figure 2: Search for "earthquake" in the advanced search area.

Open the seismology category within the result list and navigate to the subcategory named, Historical earthquakes (fig. 3). Three services, which according to their names ("Historical earthquakes 1000-1899"), appears to be similar, but reflect the same data with their corresponding community standard format in parenthesis (FDSN-event, OGC WFS, OGC, WMS).
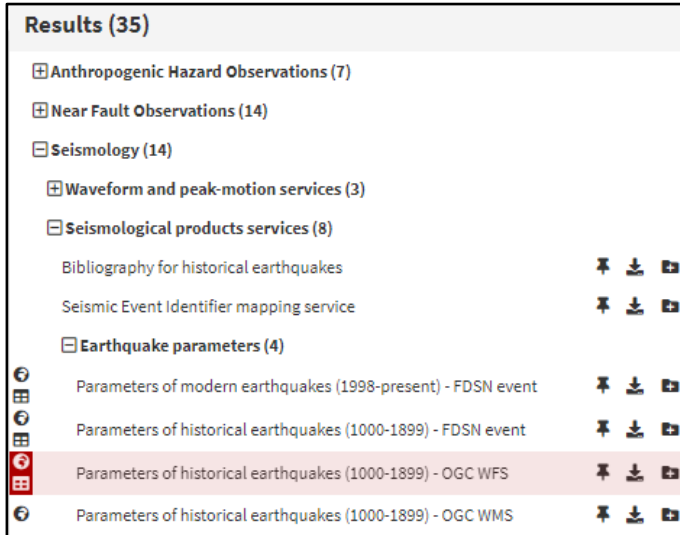

Figure 3: Historical earthquakes data represented by multiple services.

To demonstrate the options each of these services offers, first click the WFS service. The configuration page gets filled with multiple input fields. The first appearing parameter is coordinates given by latitude and longitude (fig. 4). This parameter is available for all services within the ICS data portal. In the current setup, the default coordinates given by the service represents the coverage region and the values are apparently locked. These values reflect the coordinates given during the search for services. If a user would like to alter the coordinates just for this service, without affecting all other services, the values can be changed by activating the override function right next to the locked fields.
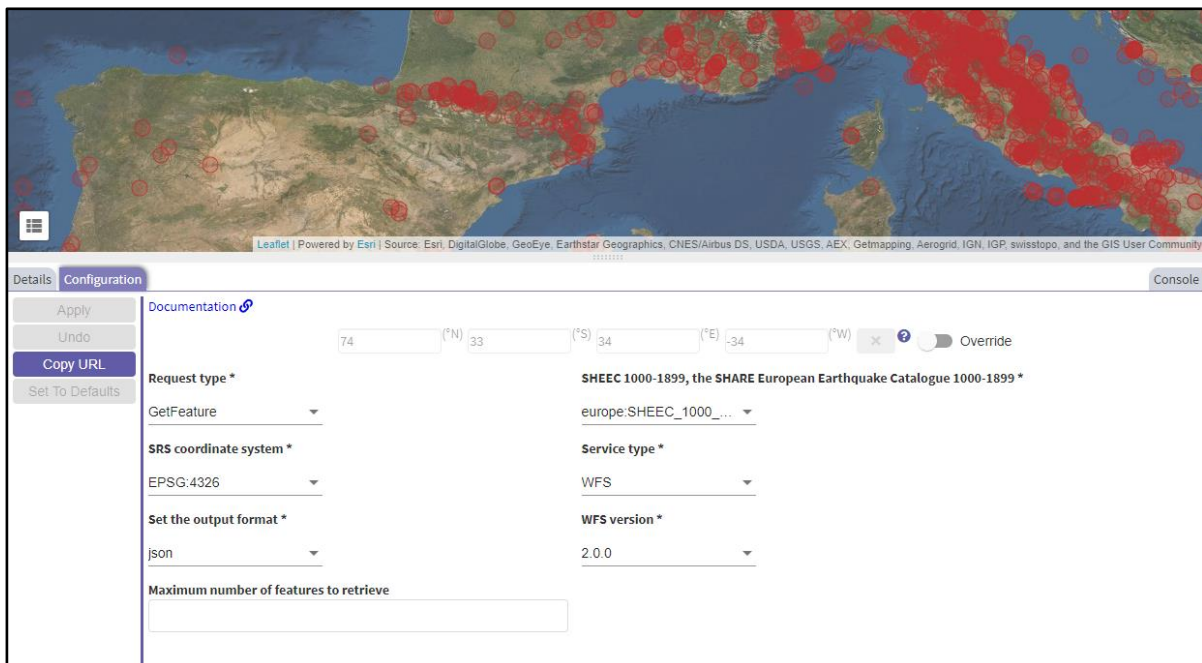

Figure 4: Configuration view of the historical earthquake WFS service.

The other kind of options, represented by input fields or dropdown lists, are the specialized configurable options defined by the service. Mandatory parameters are marked by a star in the label attached to each configurable parameter. In the case of this WFS, all options given are expected to be available for all WFS services, hence the form of parameters are standardized. Most parameters in this example appear as dropdown options with predefined values to choose from. In many other services, this is not the case, and the user is left with an input field which can take any value given. However, the parameter does expect a value in a particular way and/or have limitations applied. If the user is familiar with that kind of service, it should normally not be a problem to specify the values, but it may serve as an obstacle for others. Within the WFS example, the "Maximum number of features to retrieve" field does imply that the user should type in a number, and you would easily infer that it should be a positive number, but the text labels may not always be that descriptive. In this regard, documentation is available for each service, where the user can find information about the service itself and which values and limitations that are expected for the parameters. The documentation is accessible by clicking the "Documentation link" in the top left corner of the configuration page.
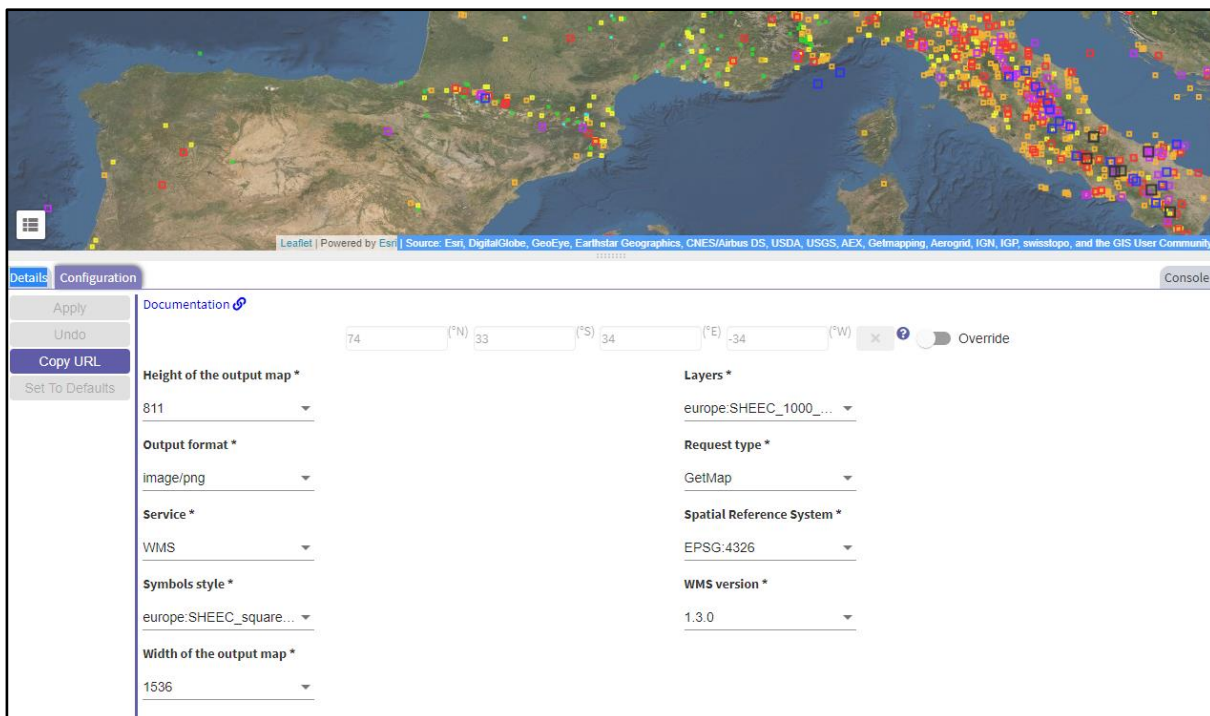

Figure 5: Configuration view of the historical earthquake <u>WMS</u> service

Before diving into the actual configuration, an exploration of other available options can be done by clicking the other "historical earthquake" services. Select the WMS service and a completely different set of configurable options will appear in the configuration tab (fig. 5). This tutorial is not going in depth to explain the difference between these standards, but WMS services provide image files while WFS provide vector files. While these standards are more configurable to the data representation and file support, other services do offer more options for filtering of the data itself. Select the FDSN event service and a longer list of parameters will appear (fig. 6). As mentioned earlier, an option for overriding coordinates is available for all services. In addition, for services that allow to configure start and end time, an override function for the time constraint is also present as evident by the FDSN event service. Other service specific parameters are given to directly influence the data retrieval like min and max magnitude for this example.
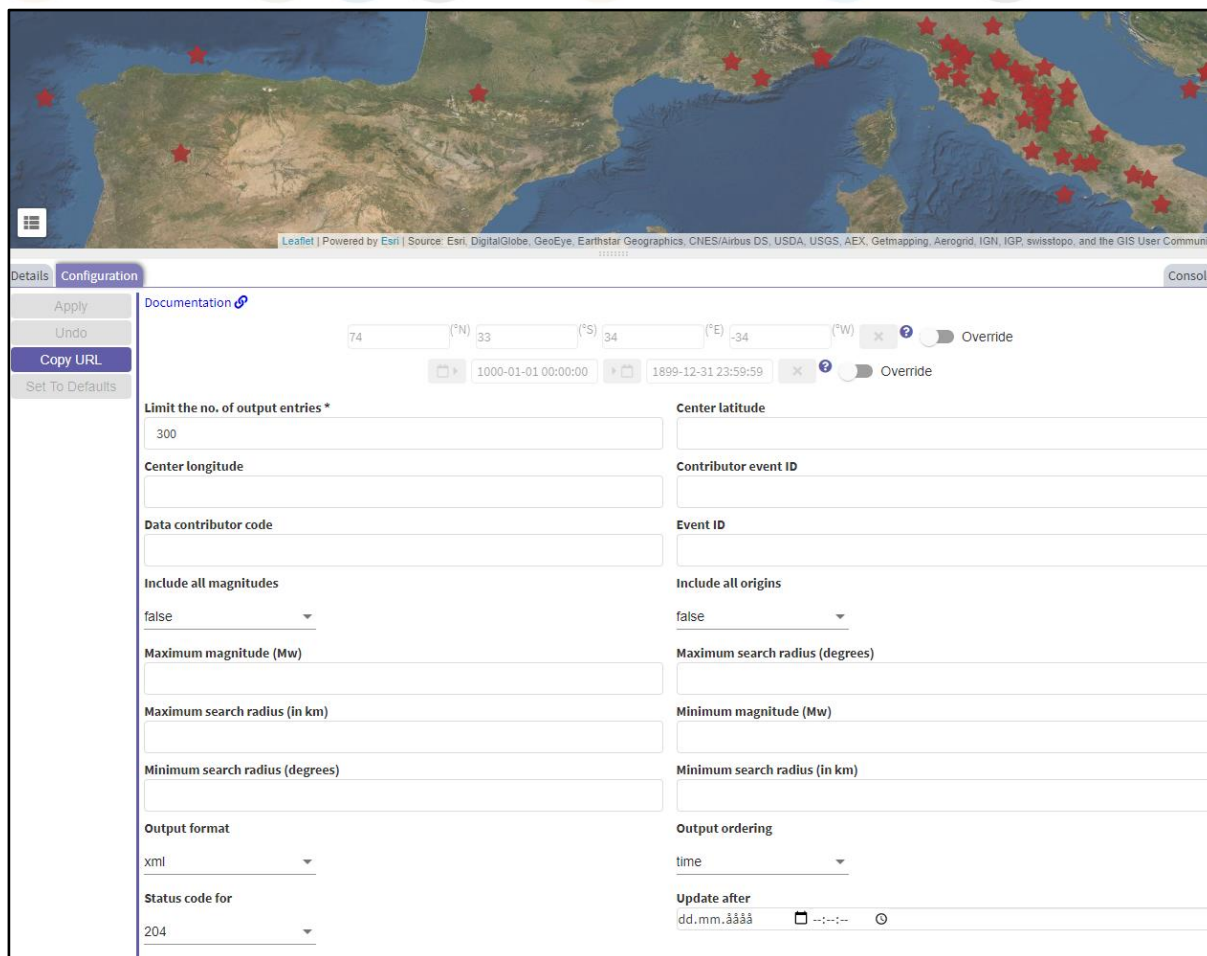
Figure 6: Configuration view of the historical earthquake <u>FDSN event</u> service

How to configure the service?

The first step to configure the service is to find the parameters which you want to change. To find out which parameters that are available, please check out the previous section. In the FDSN event service for historical earthquakes, presented in the previous section, the number of earthquakes in the map were less than for the other services (fig. 4-6). The reason for this, is a parameter for limitation of output entries provided by this service, which by default were specified to 300 events. To allow for additional events, the number can be increased. Please be aware that the service may have an upper limitation for this number. For this particular service, the current documentation reveals a range between 1 and 5000 events for this parameter. In this example, increase the limit to 1000 events and click the "Apply" button to the left (fig. 7). The apply button is by default deactivated but will be executable once the user changes any parameter. In addition, an "Undo" button and "Set To Defaults" button is provided. Upon clicking the apply button, the number of events plotted on the map increases (fig. 8).
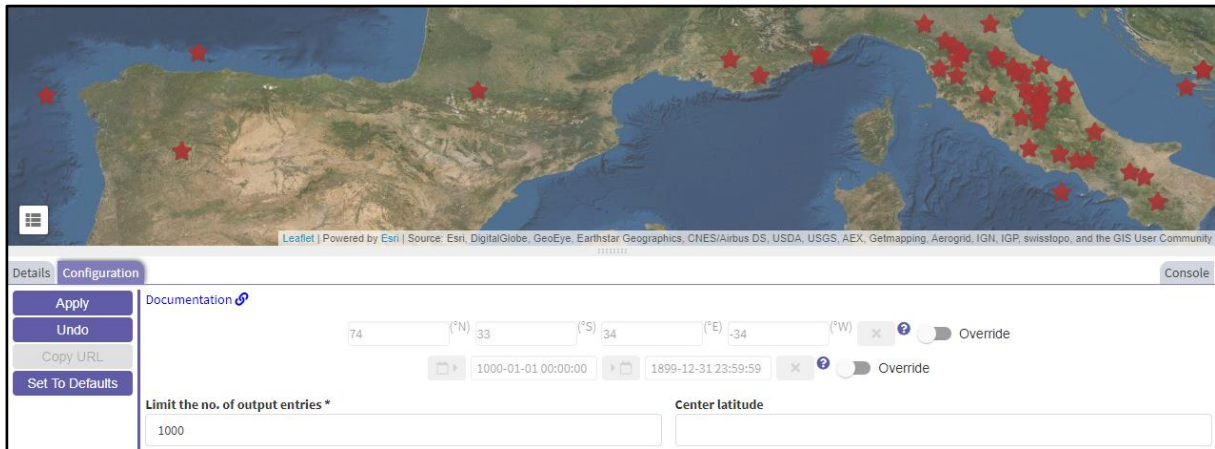
Figure 7: Editing the limit of output entries in the FDSN event service, where a change in the input field activated the apply and undo button. To execute the change, the apply button must be clicked.
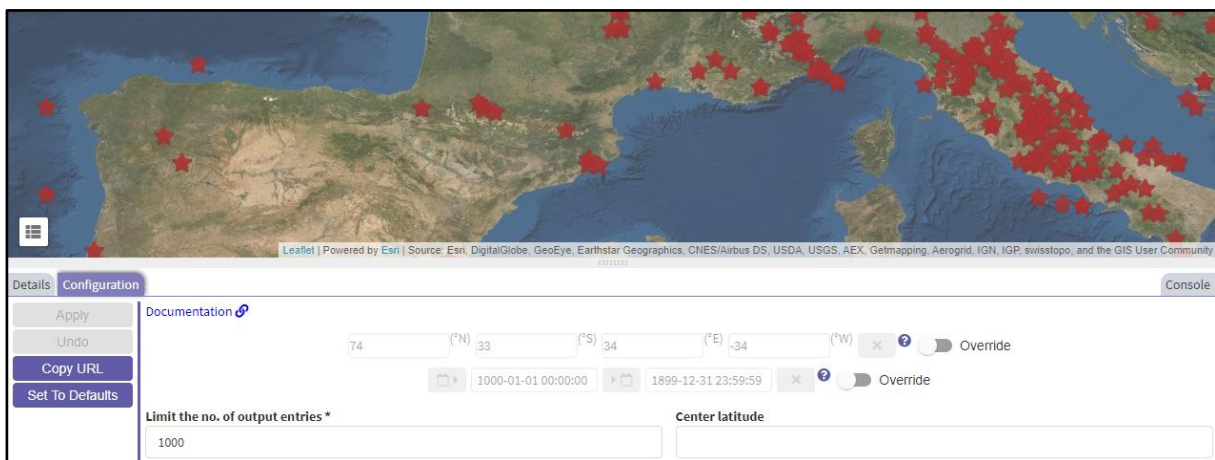

Figure 8: The result of changing the limit of output entries in the FDSN event service.

Configuration of services normally include the ability to narrow down the result to a smaller selection of data. The parameter of limit the output entries were an exception in this example. Another configuration option for filtering the data can for example be made to the magnitude value. By default, these entry fields are blank, meaning that the data include all events of all magnitudes. To constrain the data to only include larger earthquakes, the minimum and maximum parameters can be set to for example 6.5 and 9, respectively. The number of earthquakes plotted on the map is significantly reduced (fig. 9).
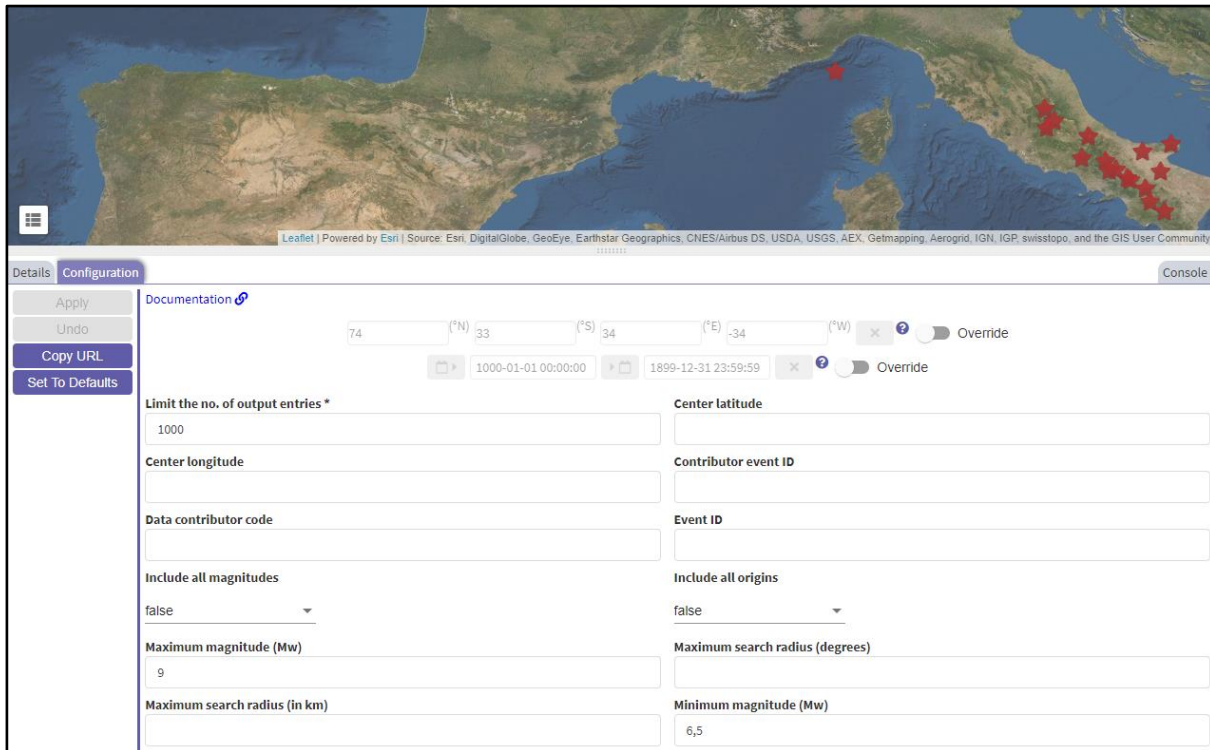
Figure 9: The result of constraining the earthquakes by an interval for magnitude of 6.5 to 9.

How to use the configured data in other applications?

The users of the ICS data portal may want to use the data elsewhere, for example within the own scripts, without **physically** downloading the files. Every service provided in the portal is a web-service which is configured by attaching parameters to a web address, also known as Uniform Resource Locator (URL). The configuration tab can thus act as a query builder form for constructing the entire URL needed for acquiring the filtered data. The URL can be obtained by clicking the "Copy URL" button. By doing so, a notification will appear on the screen, telling users that the URL has been copied to the clipboard (fig. 10).
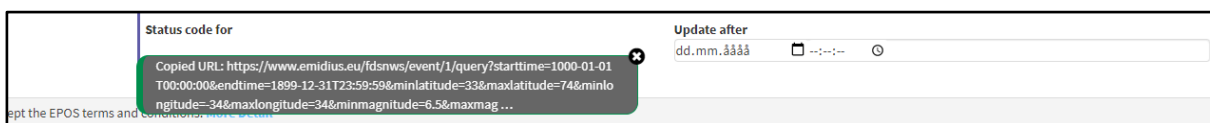
Figure 10: Notification of copied URL.

How to get an overview of the configurations made?

While browsing and selecting services, the user may need to review which services that was visited or get information about errors related to a service. This information can be found within the console tab, which is accessible by clicking the "console" button on the right side (fig.11). Every call to a service will be logged and marked by a success when data is received or provide an error message if something went wrong. Changes made on the coordinates and time in the toolbar above the map will also be logged with its respective values used.

Figure 11: Console logging of API related calls, showing which services that have been called and whether the query to these were successful or not.